

To the Members of the Halden Programme Group

**Invitation to Halden Project Workshop on**  
***“International assessment of safety assurance approaches”***

*Rockville MD, USA, 14<sup>th</sup> – 15<sup>th</sup> March 2019*

Please find enclosed information about a Halden Project organized expert workshop on *“International assessment of safety assurance approaches”*. As part of the HRP Digital I&C Safety Demonstration project, this workshop intends to elicit the technical basis underlying the safety assurance approaches used in various applications of safety-criticality comparable to nuclear reactor protection. The purpose is to learn from experiences across application sectors. The workshop is designed to validate prior results of HRP’s international assessment (primarily based on surveys and publications), identify gaps and challenges, promising directions to address them, and provide input to the next HRP 3-year program on digital systems research. The workshop will be organized in panel-based sessions, including discussion across different perspectives.

We kindly request members of the Halden Programme Group to nominate participants with interest and relevant expertise who can contribute to fruitful discussions in the workshop. HRP will send advance information about the discussion topics.

The workshop will take place in Rockville MD, USA, starting on Thursday 14<sup>th</sup> March 2019 at 13:00 (after closure of the RIC conference) and ending on Friday 15<sup>th</sup> March at 17:00.

For further technical information on the workshop, please contact Peter Karpati (Peter.Karpati@ife.no), leader of HRP DI&C Safety Demonstration project, and for logistical information, Jannicke Margrethe Neeb (jannicke.neeb@ife.no), Coordinator, IFE Digital Systems. Registration is requested before 15<sup>th</sup> February 2019. Registered participants will receive additional background material before the workshop.

Halden, 15<sup>th</sup> January 2019

Jon Kvaalem (sign)  
Project Manager

### Objective and motivation for the workshop:

This workshop is an opportunity for safety assurance experts from different safety critical application sectors to learn from each other about best practices and the state of the art in safety assurance of critical digital automation systems, focusing on the common body of scientific and engineering knowledge underlying their seemingly different approaches. A common objective of organizations using or providing critical digital automation is to demonstrate (assure), in an independently verifiable manner, that their systems are safe. A common objective of regulatory bodies is to conclusively evaluate that the assurance is reasonable. Given these common objectives and a common body of scientific and engineering knowledge, your active participation will identify valid elements of the technical basis underlying the safety assurance approaches used in various applications of safety-criticality comparable to nuclear reactor protection. Your experience will be valuable for filtering out the differences in approaches taken by industrial organizations and regulatory bodies in different application sectors, which are rooted in organizational cultures, traditions, resource constraints and other non-technical factors.

This workshop invites safety assurance experts, developers and evaluators from different organizations and offer a stage for comparison of their approaches while digging down to foundational commonalities or differences. Through the workshop discussions, we hope to improve common understanding of the stakeholders and thus reduce and ease their related efforts as well as improve quality of submittals.

### Background and context:

The DI&C Safety Demonstration activity is an established part of the digital systems research portfolio in the HRP programme. The goals of the current three-year period (2018-2020) are defined as follows:

- Solutions for safety argumentation related problems and challenges as experienced by reviewers (i.e. regulators, third parties) and by authors (i.e. licensees, suppliers) of safety arguments
- State-of-the-art guidelines for safety argumentation with special focus on DI&C systems in NPPs; how scientifically sound reasoning can be applied in practical safety-critical cases
- Theoretical (i.e., scientific) foundations of the future safety demonstration framework

The knowledge to be gathered during the workshop will support all three goals since it will extract the best practices and the state-of-the-art in safety assurance. The workshop will also help identifying and prioritizing the relevant challenges for HRP's next three-year period.

### Scope:

The search for best practices and the state-of-the-art is focused on digital automation of safety criticality comparable to the protection of nuclear power reactors. Examples of application areas include nuclear safety systems, aircraft flight controls, autonomous driving systems, and life-critical medical devices. The workshop focuses on identifying the scientifically valid technical basis underlying the safety demonstration and regulatory approaches, rather than laws, regulation or governance policies. An important by-product will be the identification of gaps in the technical basis and promising directions to bridge those gaps to the extent that different safety assurance experts could reach the same conclusion. HRP's DI&C Safety Demonstration activity has identified many topics of controversy, and, with the support of its advisory group, will formulate questions suitable for discussion in the workshop. This information will be included in an updated agenda and sent to registered participants before the workshop.

The workshop will consist of 4 moderated panel-based sessions, each focusing on the previously identified questions. The panelists will brief the participants with an overview of the topic, the controversy, questions, or gaps to be addressed, and their views on the promising directions. The introduction by the panelists will be followed by a discussion between workshop participants. Each session will be closed with a summary of the discussion.

Agenda:

Thursday 14<sup>th</sup> March, afternoon:

- Welcome and introduction of participants
- Presentation of the workshop-relevant results of HRP's Digital I&C Safety Demonstration activity
- Panel session 1

Friday 15<sup>th</sup> March, morning:

- Panel session 2
- Panel session 3 including work lunch
- Panel session 4
- Summarizing plenary discussion
- Plenary discussion of research directions and priorities for the DI&C Safety Demonstration activity
- Conclusions with closing remarks from participants and HRP

Outcome and further work:

It is expected that the workshop will be of direct value to member organizations and to future HRP activities in this area of research, through the identification of the key challenges and promising research directions. The workshop results will be provided within four weeks after the workshop, and results and findings will be summarized in a Halden Work Report.

Organisational information:

The workshop will take place Thursday 14<sup>th</sup> March at the [Bethesda North Marriott Hotel and Conference Center](#), and Friday 15<sup>th</sup> March at the [US NRC White Flint North \(3WFN\) building](#), both in Rockville MD, USA. The Halden Project is pleased to invite all participants for a working session over dinner on Thursday evening, 14<sup>th</sup> March.

Participants are requested to register before 15<sup>th</sup> February 2019. For registration and logistical information, please contact Jannicke Margrethe Neeb ([jannicke.neeb@ife.no](mailto:jannicke.neeb@ife.no)), Coordinator, IFE Digital Systems.

For further technical information on the workshop, please contact Peter Karpati ([Peter.Karpati@ife.no](mailto:Peter.Karpati@ife.no)), leader of HRP DI&C Safety Demonstration activity.